

## Patent Claims

1. Method for fabricating thin metal-containing layers having low electrical resistance, having the following steps:
  - a) formation of a metal-containing starting layer (5A) having a first grain size on a carrier material (1, 2, 3, 4); and
  - b) production and movement of a locally delimited thermal region (W) in the metal-containing starting layer (5A) in such a way that a recrystallization of the metal-containing starting layer (5A) is carried out for the purpose of producing a metal-containing layer (5C) having a second grain size, which is enlarged with respect to the first grain size.
2. Method according to Patent Claim 1, characterized in that, in step a), interconnects (5) are formed in a primary direction (x) and/or in a secondary direction (y), which is essentially perpendicular to the primary direction; and in step b), the movement of the thermal region (W) is carried out essentially in the primary direction (x) and/or in the secondary direction (y) or at an angle of 45 degrees to the primary and secondary direction (x, y).
3. Method according to Patent Claim 1 or 2, characterized in that step b) is carried out repeatedly.
4. Method according to one of Patent Claims 1 to 3, characterized in that, in step b), the locally delimited thermal region (W) is produced by means of a fanned-out laser beam, a hot gas, a multiplicity of heating lamps and/or a heating wire.
5. Method according to one of Patent Claims 1 to 4,

characterized in that the locally delimited thermal region (W) is formed in strip-type or point-type fashion.

- 5 6. Method according to one of Patent Claims 1 to 5, characterized in that, in step a), a metal alloy or a doped metal with an impurity proportion of less than 5% is formed as the metal-containing starting layer (5A).
- 10 7. Method according to one of Patent Claims 1 to 6, characterized in that the carrier material has a diffusion barrier layer (3) and/or a seed layer (4).
8. Method according to one of Patent Claims 1 to 7,  
15 characterized in that, in step a), a damascene method is carried out.
9. Method according to one of Patent Claims 1 to 8, characterized in that the locally delimited thermal  
20 region (W) has a temperature of 150 degrees Celsius to 450 degrees Celsius.
10. Method according to one of Patent Claims 1 to 9, characterized in that the recrystallization is carried  
25 out in a protective gas atmosphere.

Abstract

Method for fabricating thin metal-containing layers having low electrical resistance

The invention relates to a method for fabricating thin metal-containing layers (5C) having low electrical resistance, firstly a metal-containing starting layer (5A) having a first grain size being formed on a carrier material (2). Afterwards, a locally delimited thermal region (W) is produced and moved in the metal-containing starting layer (5A) in such a way that a recrystallization of the metal-containing starting layer (5A) is carried out for the purpose of producing the metal-containing layer (5C) having a second grain size, which is enlarged with respect to the first grain size. A metal-containing layer having improved electrical properties is obtained in this way.

Figure 3

List of reference symbols

- 1 Carrier substrate
- 2 Dielectric layer
- 3 Diffusion barrier layer
- 4 Seed layer
- 5, 5A, 5B, 5C Metal-containing (initial) layer
- 6 Protective layer
- w1, w2 Structure widths
- W Locally delimited thermal region